

ASSESSMENT OF THE FEDERAL-AID ELIGIBLE SYSTEM

MCL 247.659a directs the Council to focus its efforts on the federal-aid eligible system first and then once completed, continuing on with local roads and streets.

Certified Miles

There are 617 agencies that are funded through the Michigan Transportation Fund. These agencies had jurisdiction over some 120,440 route miles (centerline miles). Since 1965, the system has grown by over 7,200 miles of which 61% is in city-owned streets. (See following table.) This is logical when one considers the urbanization growth during the 70s and 80s. However, if you look at the last 5 years a very different picture emerges. Since 1998, just over 800 miles have been added, an average of 160 new miles a year. Two-thirds of this growth (66%) has been on the county-owned system. This reflects the growth of residential and commercial activity that has taken place in townships located on the edges of urban areas. [Note: The negative figure for state-owned roads is due to the transfer of miles to local jurisdictions as new roads were opened like US-127.]

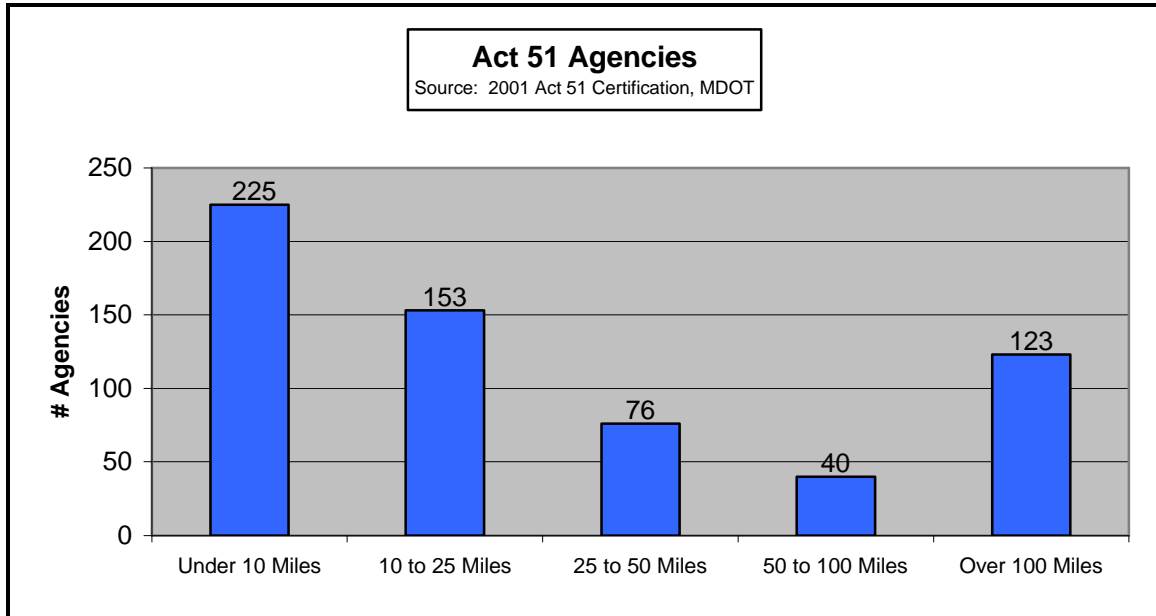
SYSTEM GROWTH

	1965		2003		Change in Miles	Percent of Miles Changed
	Miles	Percent	Miles	Percent		
State Trunkline	9,239.00	8%	9,722.00	8%	483	7%
County Total	87,465.00	77%	89,877.00	75%	2,412.00	33%
City Total	16,523.00	15%	20,841.00	17%	4,318.00	61%
Grand Totals	113,227.00	100%	120,440.00	100%	7,213.00	100%

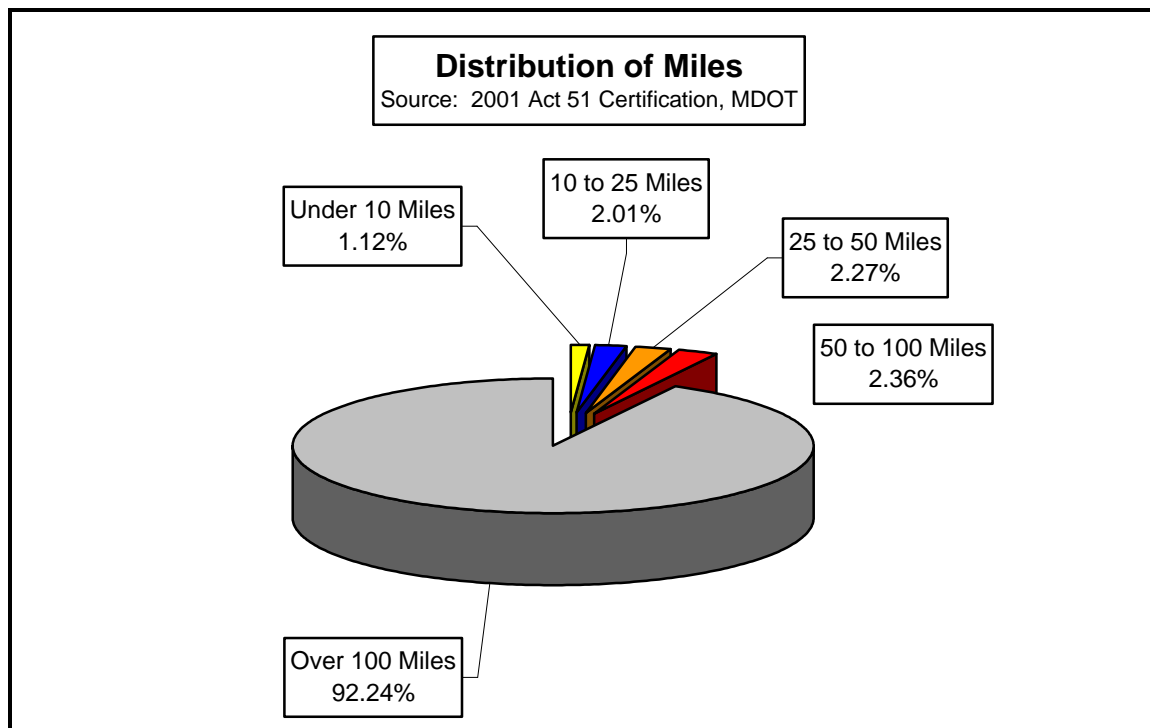
	1998		2003		Change in Miles	Percent of Miles Changed
	Miles	Percent	Miles	Percent		
State Trunkline	9,725	8%	9,722.00	8%	-3	0%
County Total	89,344	75%	89,877.00	75%	533	66%
City Total	20,570	17%	20,841.00	17%	271	34%
Grand Totals	119,639	100%	120,440.00	100%	801	100%

Sources: 1965 data – "Highway Classification in Michigan," Dept. of State Highways, 1967, p. 19. 2003 data: Official Certification, Asset Management Section, Bureau of Transportation Planning.

The distribution of mileage among the 617 agencies is quite disparate. There are agencies with jurisdiction over as little as a mile or less to MDOT with jurisdiction over 9,700 miles. The following graph shows the distribution of agencies by system size. The data comes from the Michigan Department of Transportation's Act 51 certification for 2001.



The vast majority of the highway assets – 92% of all route miles – are managed by the 123 agencies with jurisdiction over 100 miles of road. These 123 agencies represent 20% of all agencies, whereas 80% of the agencies own only 8% of the assets.



Data Collection Effort

Transportation asset management is a data intensive process. The ultimate goal of any asset management process is to provide the data and tools for decision-making in both the short-term and the long-term. For any asset management system to work effectively, appropriate data must be collected, stored, and analyzed.

Data collection for 2003 was coordinated through the 20 regional planning agencies and metropolitan planning organizations. Each of the planning agencies and MPOs were responsible for initiating and maintaining contacts for training and scheduling with the road agencies in their respective areas.

MDOT staff, experienced in data gathering, conducted 10 training sessions around the state. Over 200 individuals attended. The training consisted of a review of the various PASER ratings, overview of how to use the RoadSoft laptop data collector, and a discussion of “rules of thumb” to use while in the field.

Teams of county, state, city and regional staff worked in cooperation. This was a critical component of the data collection effort. Follow-up reports to the Council indicated that the increased cooperation was one of the positive outcomes about the process.



Up to 11 teams worked from the last part of July until just before Thanksgiving. They drove nearly 54,500 miles and rated 43,066 miles of road. This effort required 2,060 crew hours. In addition to the PASER rating, crews collected information on the type of surface (asphalt, concrete, etc.) and the number of lanes. Vehicles were equipped with a global positioning satellite (GPS) receiver which allowed for accurate locating of information and tactical use of the data by local agencies.

Quality Control

Our primary means of quality control was to have PASER ratings collected twice, by two different crews, on the state trunkline. We collected the information both through the Council's data collection process and MDOT's Sufficiency process. Because PASER is a subjective, visual assessment, we wanted to test how closely two groups of raters would be, on the same stretch of road, working totally independently of each other. The raters working on behalf of the Council were not aware of the other group. We reviewed the ratings of both groups and determined the percentage of times that the ratings were within one or two rating points of each other. Statewide, the results were satisfactory with an average of 93% of the miles rated being within one or two points of each other. It is also important to point out that the Council has just completed the first year of data collection in this process. The Council has established a goal to increase this accuracy.

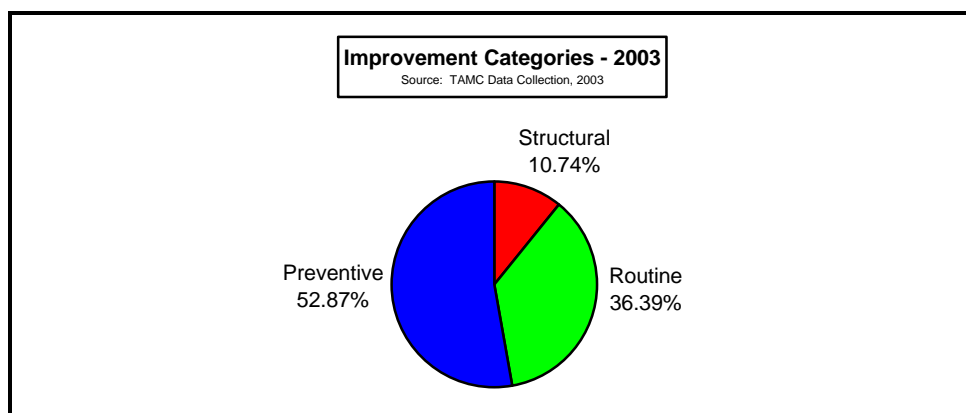
Road and Bridge Condition

During the months of July through November, 11 teams of surveyors drove some 54,500 miles in order to assess the condition of the state's 43,066 miles of federal-aid eligible roads. This was the most extensive effort since the 1983 Needs Study.

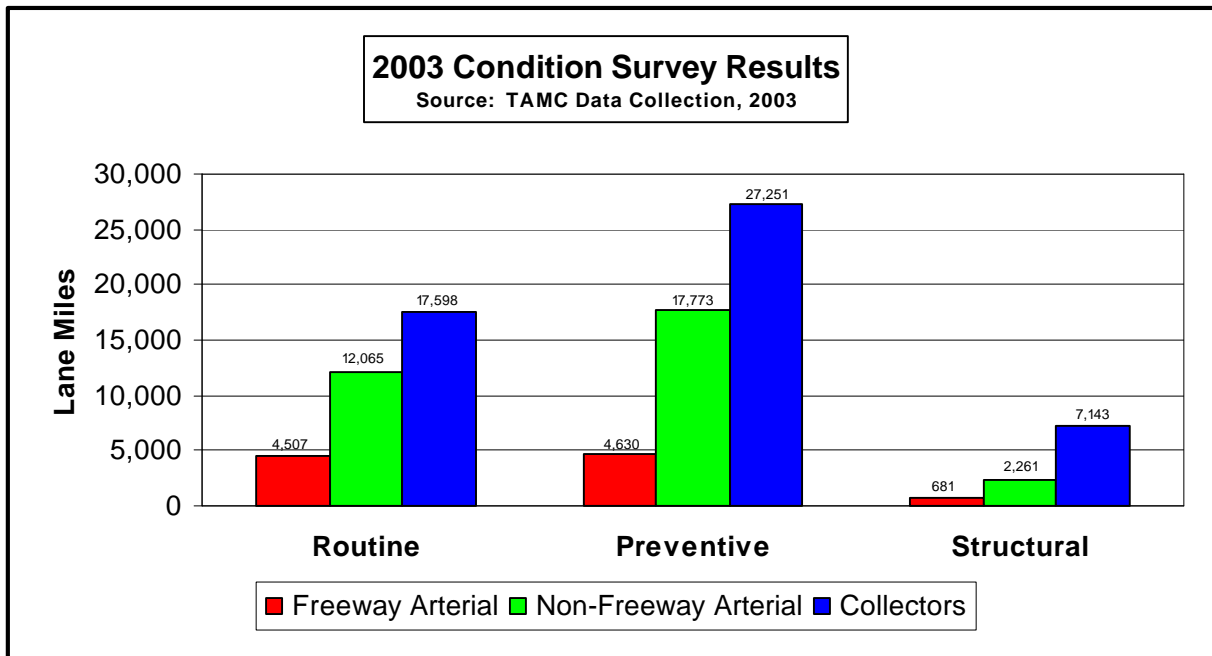
The data is reported in lane miles. A lane mile is determined by multiplying the number of lanes by the length of the road. For example, if you were surveying 5 miles of a 2 lane road you would be rating 10 lane miles. If it were a 4 lane road then you would have 20 lane miles. So while we had 43,066 route miles this translated into over 93,900 lane miles.

The Council does not report the individual ratings of a segment of road. The Council uses the data to report statewide and regional condition totals and that individual ratings of individual segments are reported back to the appropriate jurisdiction for use in the development of local projects. The Council groups the ratings into three "work improvement" categories. These categories are "routine maintenance" (ratings 8, 9, 10), "capital preventive maintenance" (ratings 5, 6, 7), and structural improvement (ratings 1, 2, 3, and 4). These categories represent broad areas of work that might be undertaken in order to maintain, preserve, and improve the overall condition of the network. See the Appendix for tables related to the survey.

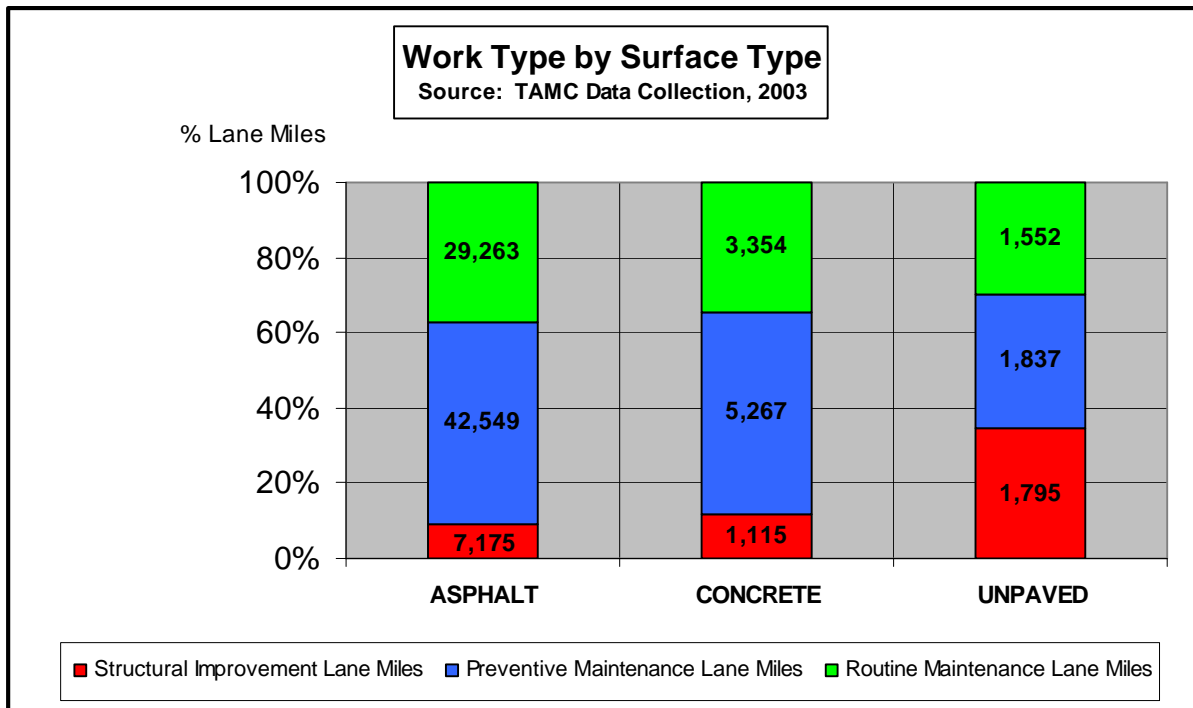
Overall there were nearly 34,170 lane miles needing routine maintenance; 49,653 lane miles needing capital preventive maintenance; and 10,085 lane miles needing structural improvement.



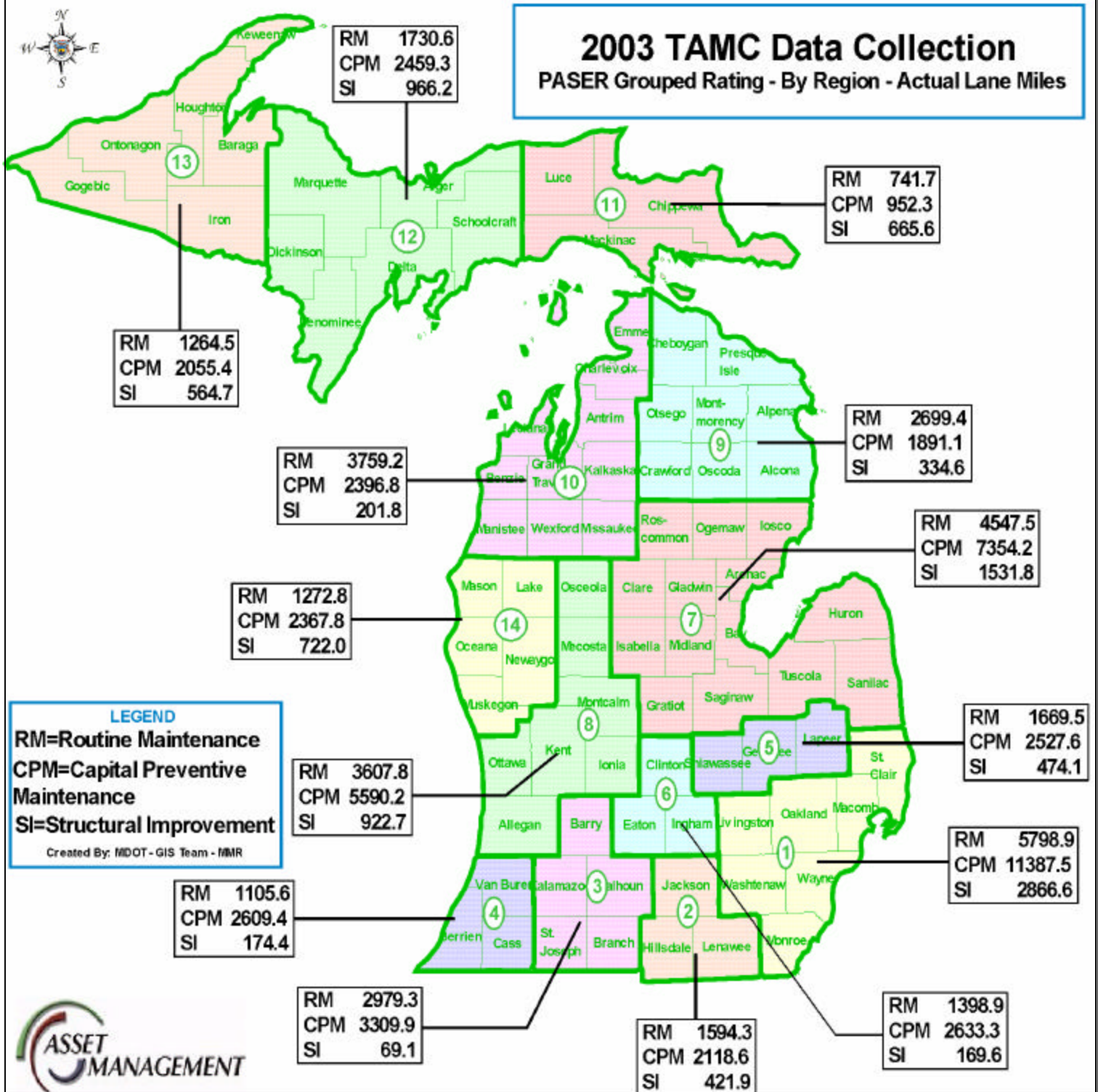
The largest group needing structural improvement was collectors with 7,143 lane miles falling into this category. The smallest group was the freeways with only 386 lane miles needing structural improvement. The following graph shows these breakdowns.



The Council also analyzed the data based on surface type. Nearly 85% of the lane miles on the federal-aid eligible system are asphalt, with concrete making up 10% and unpaved or brick the remaining 5%. The following graph shows the results of the survey by surface type.



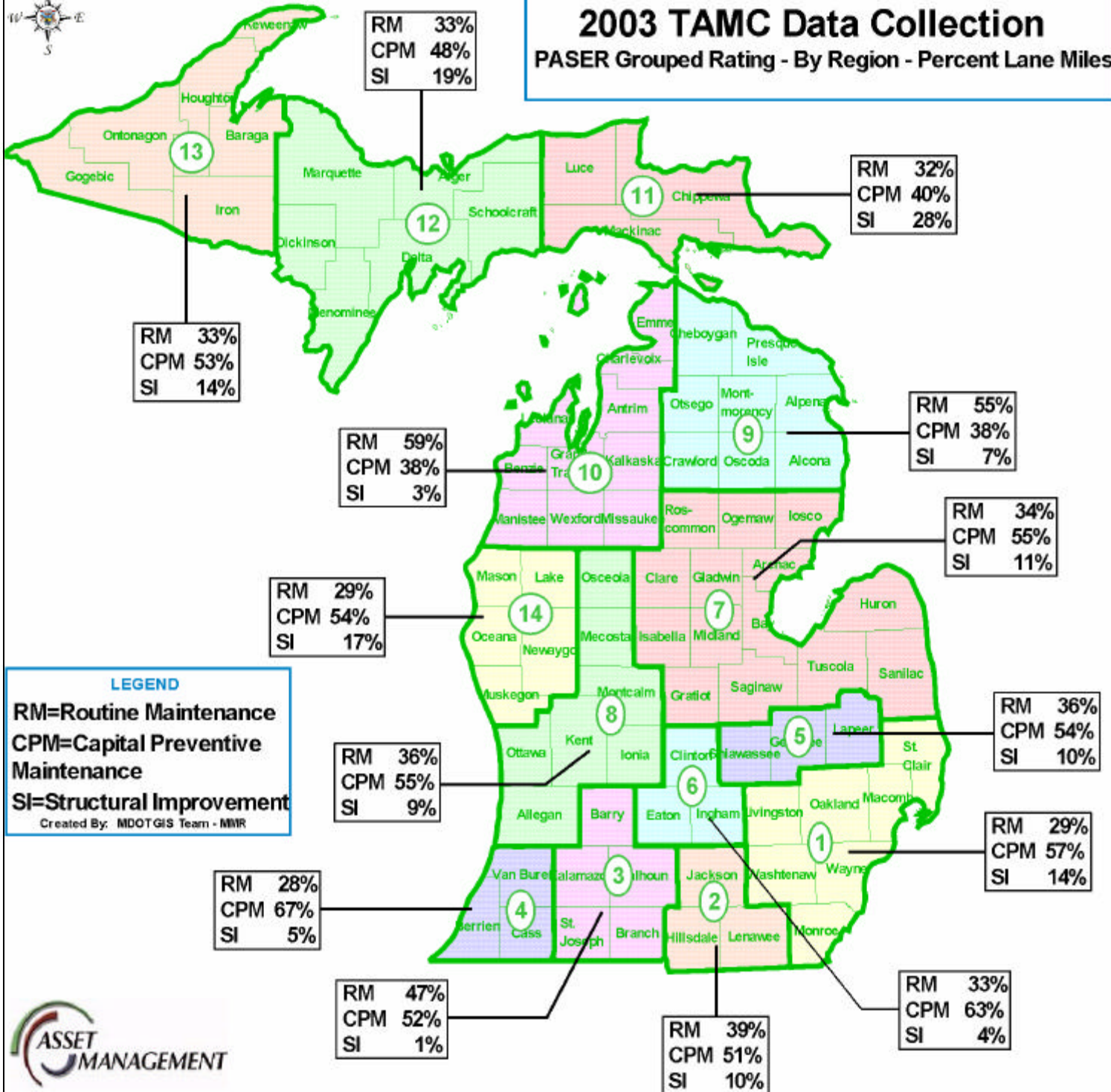
Results from 2003 TAMC Data Collection



Results from 2003 TAMC Data Collection



2003 TAMC Data Collection PASER Grouped Rating - By Region - Percent Lane Miles



Bridges

Bridges can be classified as “structurally deficient” or “functionally obsolete.” These classifications are determined by the National Bridge Inventory database (NBI). A **structurally deficient** bridge is one in which at least one of the major structural elements (deck, superstructure, or substructure) has a condition rating of poor or worse. A **functionally obsolete** bridge is one that is not structurally deficient, but has deficient roadway width, vertical clearance, waterway, road alignment or load capacity.



Federal law requires that bridges be inspected at least once every two years. There are 9 different categories which determine whether a bridge is classified as “deficient.” Condition ratings are based on a 0-9 scale and assigned for the superstructure, the substructure, and the deck of each bridge. A condition of 4 or less classifies the bridge as being “deficient.”

<u>CATEGORIES</u>	<u>NBI CONDITION RATINGS</u>
Culvert Condition	9=Excellent
Approach Alignment	8=Very Good
Underclearance	7=Good
Deck Geometry	6=Satisfactory
Waterway Adequacy	5=Fair
Structural Evaluation	4=Poor
Substructure Condition	3=Serious
Superstructure Condition	2=Critical
Deck Condition	1="Imminent" Failure
	0=Failure

Structurally Deficient: Generally, a bridge is structurally deficient if any major component is in “poor” condition. If any one or more of the following are true, then the bridge is structurally deficient.

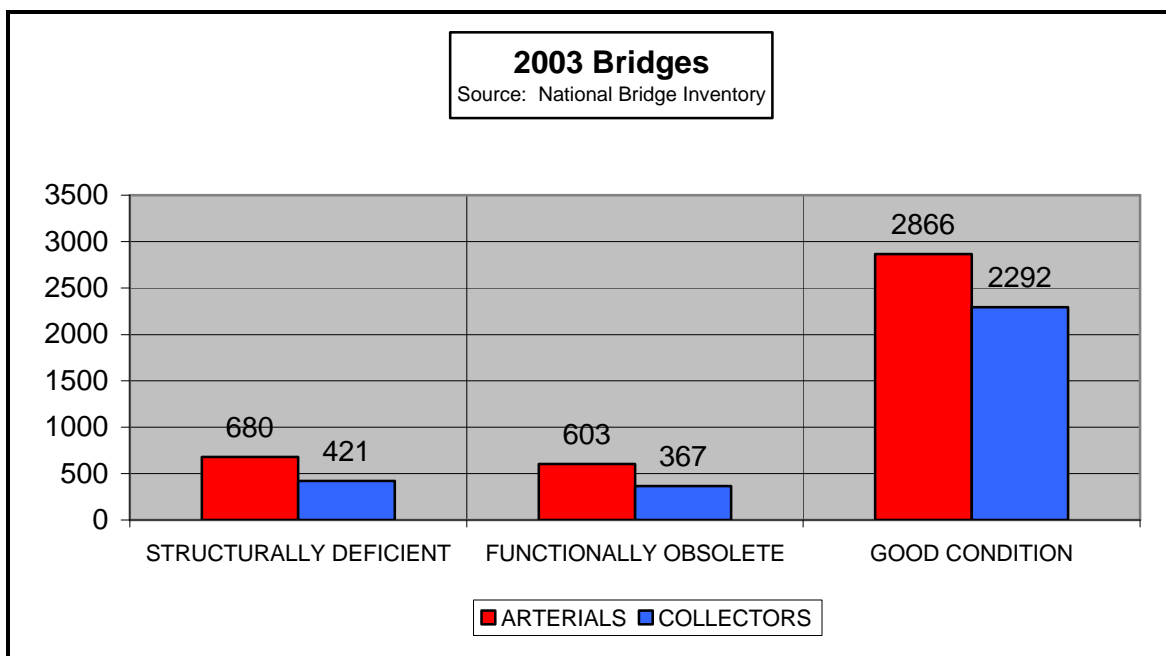
Deck Rating is less than 5
 Superstructure Rating is less than 5
 Substructure Rating is less than 5
 Culvert Rating is less than 5
 Structural Evaluation is less than 3
 Waterway Adequacy is less than 3

Functionally Obsolete: Generally, a bridge is functionally obsolete if it is NOT structurally deficient AND its clearances are significantly below current design standards for the volume of traffic being carried on or under. More specifically, if the bridge is NOT structurally deficient AND any one or more of the following are true, then the bridge is functionally obsolete.

Structural Evaluation = 3
 Deck Geometry is less than 4
 Underclearance is less than 4 and there is another highway under the bridge
 Waterway Adequacy = 3
 Approach Roadway Alignment is less than 4

A bridge cannot be classified as both structurally deficient and functionally obsolete. If a bridge qualifies for both, then it is reported as structurally deficient. While functionally obsolete bridges represent needed improvements if the overall system is to achieve maximum operating efficiency, the bridges rated as structurally deficient require more immediate attention.

Only 9% of the bridges on the arterial system are currently rated as structurally deficient and 6% on the collector system. Forty percent of the bridges on the arterial system are in good condition and 32% of those on the collector system are rated good. The remaining bridges are considered functionally obsolete. The following graph shows the condition of the state's bridges for 2003.



INVESTMENTS IN THE SYSTEM

MCL 247.659a(9) requires the Council to report on the “receipts and disbursements of road and street funds”. The language mirrors that in MCL 247.664. This section of Act 51 of the Public Acts of 1951, as amended, requires local road agencies to report to the department on how they spent their road funds during the previous fiscal year. The use of the same language in MCL 247.659a(9) was deliberate. It was intended that the Council would be able to use the annual financial reports for the Council’s reporting requirements, thus easing the reporting burden on local agencies.

However, in reviewing recent Act 51 reports and the forms agencies use to file the required information, it was discovered that the data currently being reported does not allow expenditures to be categorized into various improvement groups. Further, the data reported by city and county agencies is reported differently from the way MDOT reports its expenditures.

The Council needs information related to investments made in the preservation and improvement of pavements and bridges. They also need accurate information on routine maintenance. Currently, these expenditures are often included in other categories and cannot be deciphered independently. Further, the Council needs the information in such a manner as to be able to determine total expenditures for routine maintenance, capital preventive maintenance, and structural improvements. This cannot be done with the existing reporting forms. Also, significant levels of investments can be made in the system through other funding sources such as when a city undertakes a sewer rehabilitation project and pays for the reconstruction of the road with sewer bonds or special assessments.

During 2004, the Council will be working with the department and local road agencies to more accurately define the data so that it can be used to report to the Legislature and State Transportation Commission on actual investments by program categories. The data, as reported now, is sufficient and accurate for accounting purposes but not for analyzing the type nor location of investments in the system.